

TORNADO AT PORTER, OKLAHOMA, MARCH 15, 1919.

By J. A. REIHLE.

[Dated Aerological Station, Broken Arrow, Okla., Mar. 25, 1919.]

On March 15, 1919, at 4:07 p. m., a tornado struck Porter, Okla., a town of 800 population in the northeast part of the State, 12 miles northwest of Muskogee, leaving complete destruction in a narrow path across the town. The path of the storm was from southwest to northeast, as shown by the accompanying map, figure 1; its width was about 200 feet and its length inside the town one-fourth mile.

The day was warm; intermittent showers prevailed throughout the afternoon, and the sun shone for a brief period 15 minutes before the storm broke. At Broken Arrow Aerological Station, 25 miles northwest of Porter, a pilot balloon flight was made at 3 p. m., which shows that the wind was from the south, and varied in velocity from 14 meters per second at the surface to 25 meters per second (56 miles per hour) at 500 and 750 meters aloft.

A black funnel cloud was seen approaching from the southwest or south-southwest. The funnel zigzagged back and forth as it approached, sometimes touching and again receding from the earth. The roar was heard for two or three minutes before the storm reached the town; the noise of its passing was likened to an explosion. It was accompanied by lightning and thunder and a heavy downpour of rain lasting five minutes.

There is undoubted evidence of a counterclockwise whirl. However, there is no sign of a retrograde motion of the air on the left side, as shown by debris, trees, and poles; these lean inward nearly at right angles to the direction of the path of the storm, while trees and poles on the right side are bent forward almost parallel with the path of the storm.

The storm did not pass through the center of town, but along the edge, which was mostly a thickly settled Negro district. Two persons, both Negroes, were killed and a score or more injured by flying debris. The property loss is estimated at \$200,000. A cotton gin, the Missouri, Kansas & Texas Railway depot, six business houses, 25 cottages, a church and schoolhouse were destroyed. Six horses and several dogs were killed, and the ground was literally strewn with fowls.

The first buildings demolished were those at the cotton gin of Mr. C. C. Hultquist (Nos. 1, 2, 3, fig. 1). Nothing was left of the seed house, No. 1, while the storage house, No. 3, was only slightly damaged. Corrugated iron used in these buildings was scattered across town and for a mile or more over the country to the northeast.

Both ends of the Missouri, Kansas & Texas passenger and freight depot were blown out, and a box car standing on the siding on the south side was overturned against the building. It was nearly train time and the waiting room was filled with people. Among these was a party of teachers and pupils who had been attending a school contest at the place. When the walls were carried away these people, as well as the ticket agent, were sprayed with pieces of brick and mortar, but none was seriously injured.

Just across the Missouri, Kansas & Texas tracks along Main Street begins the business section of the town, with a solid row of buildings on the west side of the street. The first building was a frame structure housing the gas distributing station. The building (No. 6) was entirely removed, the meters carried away, and one of the gas pipes supplying the stricken area was twisted and closed, thus averting a fire which might otherwise have followed. Nos. 7, 8, and 9 were, respectively, general store of Mr. Henry Allen, garage, and restaurant of Mr. Hays. All three buildings were gutted, the front and back walls

being torn out and a heavy beam binding the three buildings together across the front was removed and carried across the street. Messrs. Allen and Hays were in their respective places of business, but neither was seriously hurt. Farther down Main Street several plate glass windows were broken by the explosive action of the air, and brick walls were damaged by heavy bodies thrown outside the vortex of the storm.

In the second and third blocks after leaving the intersection of Main Street and the railroad the storm wiped

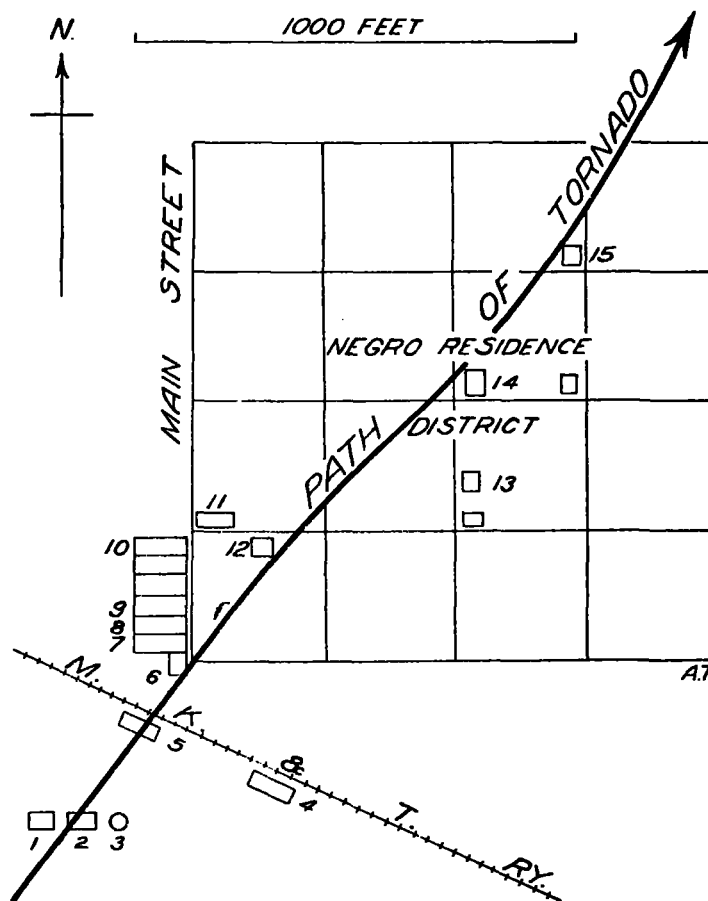


FIG. 1.—Map showing path of tornado through Porter, Okla.
 1, 2, 3. Seed, power, and storage houses of C. C. Hultquist's cotton gin.
 4. Bowers and Brown elevator.
 5. Missouri, Kansas & Texas passenger and freight depot.
 6. Gas-distributing station.
 7. General store of Mr. Henry Allen.
 8. Garage.
 9. Restaurant.
 10. First National Bank.
 11. Dunlap store.
 12. Blacksmith shop.
 13. Residence of Mr. C. B. Harris.
 14. Negro Baptist Church.
 15. Negro schoolhouse.

out nearly all the houses in the Negro district. Some 25 houses were demolished, and it seems miraculous that the occupants, many of whom were in the houses at the time, escaped alive. In a number of cases it is seen that the walls burst outward, the roof lying flat on the ground and the ceiling lying on it, both intact and upside down.

Nos. 12, 14, and 15 were, respectively, blacksmith shop, Negro Baptist Church, and Negro schoolhouse, all destroyed. The framework of the roof of the church was deposited about 75 feet north of where the church had stood (see fig. 2).

East of the path of the storm stand a few scattered buildings undamaged except that the windows were



FIG. 2.—Looking east across the path of the storm. Roof of Negro Baptist Church, all that remained of the building.



FIG. 3.—Home of C. B. Harris (center) and a few other buildings left standing east of the path of the storm. Looking east across the storm's path.

blown out. Of these, No. 13 is the home Mr. of C. B. Harris (see fig. 3), who made his way out of the storm's path and into his house just in time to escape. No. 4 is an elevator. This tall building standing so near the path of the storm and remaining undamaged shows that destructive velocities did not extend appreciably farther from the center at an altitude of 50 to 75 feet than at the ground.

Some freaks of the wind were reported. A farmer who had just left the store, started across the street when he saw the storm coming. Finding nothing else to hold to he clutched the wheel of a wagon near the curb. The wind struck and for a brief flash the man wrestled with the wagon. Then it broke from him and went flying

struck by a tornado which laid waste most of the business section. Three people are thought to have been killed and many injured. The place is said to be a pile of wreckage. A 48-mile wind was reported from Oklahoma City.

At Atchison, Kans., a cloudburst in which 3 inches of water fell within an hour, filled the streets, flooded basements and caused damage estimated at \$100,000.

A heavy windstorm which swept through Clinton, Mo., unroofed many houses in the residence section and blew railroad cars from the track. Telephone and telegraph wires are down.

Sweeping through northern Jackson and western Atchison counties in Kansas, a tornado wrecked a score of farmhouses, and injured a number of people. Buildings on two blocks in the town of Muscotah were destroyed. A heavy rain followed the wind here.

All rainfall records for the month of March were broken at Topeka when a precipitation of 3.88 inches was recorded. Small streams entering the Kaw are expected to go out of their banks before morning. Reports received from western Kansas indicate that a heavy rainfall was general throughout the Kaw Valley. Hail was reported in a few places.

The weather map of the evening of March 15 (about 6:15 p. m. local time) is reproduced as figure 4. At this time, two hours after the occurrence of the tornado, there was a northwest wind of 36 miles an hour and a temperature of 48° F. at Wichita, following a maximum velocity of 88 miles an hour, while at Oklahoma City there was a strong south wind of 36 miles an hour and a temperature of 70° F. It seems probable that some of the cold wind which was blowing at the surface in central and western Kansas overran the strong warm wind in eastern Oklahoma, and by the highly unstable and turbulent condition thereby produced caused the whirl at Porter and the excessively strong convection which made the intense storms at many other points in this region.—C. F. Brooks.

THE STORM OF MARCH 16, 1919, AT FORT SMITH, ARK.

By LEON J. GUTHRIE, Meteorologist.

A destructive thunderstorm, attended by violent wind gusts of 76 or more miles an hour, occurred a few minutes after midnight of March 15.

Lightning was observed to the west and southwest of the station about 10:30 p. m. of the 15th. Thunder began at 11:38 p. m. and continued at intervals until 1:33 a. m. of the 16th. At 12:07 a. m. the wind attained an extreme of 76 miles an hour and a 5-minute maximum of 58 miles an hour; but it blew in violent gusts that probably momentarily exceeded these figures, especially at points about 1 mile north of the Weather Bureau station. The storm moved from the southwest to the northeast, the path of greatest violence roughly following the banks of the Arkansas River, through the northern part of the city, thence through Van Buren and to Alma. The path was about 1 mile wide in Fort Smith, but had narrowed to about a half mile when it passed through Van Buren. The storm showed none of the characteristics of tornadic action, and its attendant display of lightning and thunder was extremely mild.

In the northern part of Fort Smith and in Van Buren the damage to roofs, windows, chimneys, wires, truck crops, and small frail buildings totaled in the neighborhood of \$25,000.

The greatest loss was suffered by the Berry-Beall Dry Goods Co., a wholesale house, whose entire stock, valued at \$500,000, was materially damaged. The roof of the store was blown off, and the pipes connecting the building with a large water tank were broken. The contents of the tank were emptied into the building from the top floor, drenching the entire stock.

The damage to the dry goods was approximately \$200,000, making a total loss of \$225,000 caused by the storm. Two persons are known to have suffered slight injuries, but there was no loss of life.

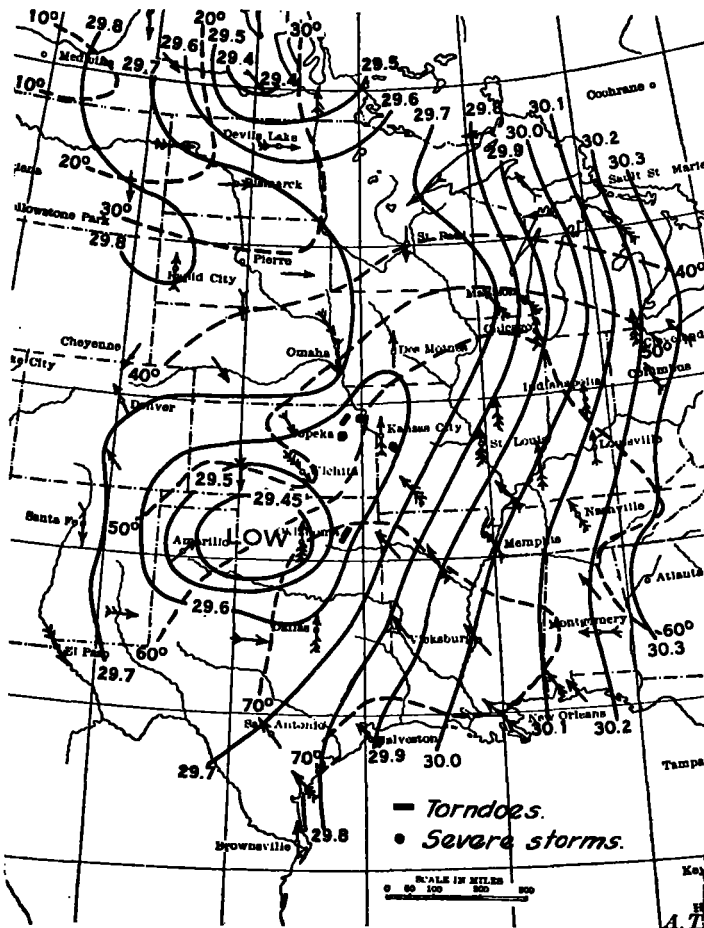


FIG. 4.—Weather map, Mar. 15, 1919, 7 p. m., 80th meridian time. Number of bars on wind arrows indicates velocities in Beaufort scale.

away in the air. The farmer was not injured. Near the railroad station four teams of horses were tied. The tornado dipped over the first team and lifted the second and fourth. The first and third teams were unharmed.

Leaving Porter the storm continued in a northeasterly direction, depositing debris picked up in Porter along its path for several miles. Two schoolhouses and some farm buildings were destroyed in the next 4 or 5 miles.

DISCUSSION.

The tornado described was one of many severe storms accompanying a cyclone central over the Great Plains on March 15. Some of these are briefly described in the accompanying account taken from the Tulsa (Okla.) Daily World, March 16, 1919:

KANSAS CITY, MO., March 15.

Three persons are reported as killed, scores injured, and a vast amount of property damaged by tornadoes and cloudbursts, which struck towns in Kansas, Missouri, and Oklahoma late this afternoon.

The town of Porter, Okla., 12 miles northwest of Muskogee, was